Coding Convention

6 Dec 2022

OUTLINE

1. File name
2. Function Name
3. Variable Name
4. Macro Name
5. File Comment
6. Function comment
7. Line comment
8. Hardcode rule
9. Block Indentation
10. Function Return
11. Casting type
12. Module in C

1. File name

[Module_name]_[Description_name].[Extention]

→ Extention: .c, .h, .ld, .s, .mot, .sre, .map

Ex: Mcu_Config.h, Mcu.h, Mcu.c

Mcu_JobQueue.h, Mcu_JobQueue.c

2. Function Name

[Module_name]_[Return_type]_[Description_name]

Return_type: vo (void), uint8, uint32,…

Description_name: describe the action (verb)

Ex: Mcu_void_Init(); Mcu_void_Reset()

3. Variable Name

g/s_[Module_name]_[Description_name]_[Type]

[Type]: uint8, uint32,…

g: global, s or l: static, a: auto

[Description_name]: describe as Noun (for what)

Ex: s_Mcu_Resetflag_bool; g_Mcu_Canclock_uint32

3. Variable Name

Local variable:

[s_][Description_name]_[Type]

[Type]: uint8, uint32,…

[s_]: for static local variable

[Description_name]: describe as Noun (for what)

Ex: s_Resetflag_bool; l_Canclock_uint32

4. Macro Name

UPPERCASE, PLEASE!!!

[Module_name]_[Description_name]

[Description_name]: describe as Noun (for what)

Ex:

```
#define MCU_CFG_CLOCK_VALUE (0x00000005U)
enum {
        MCU_CFG_CLOCK_VALUE_E = 0,
        MCU_CFG_CLOCK_VALUE1_E,
};
```

5. Typedef definition

- *To define new kinds of variables, function pointers…*
- *Clearer about meaning*

Ex:

```
typedef void (*function_pointer)(void);
typedef unsigned char uint8;
```

5. Typedef definition

```
/*----- Basic type definition -------------------------*/
typedef signed   char    int8;
typedef signed   short   int16;
typedef signed   long    int32;
typedef unsigned char    uint8;
typedef unsigned short   uint16;
typedef unsigned long    uint32;
```

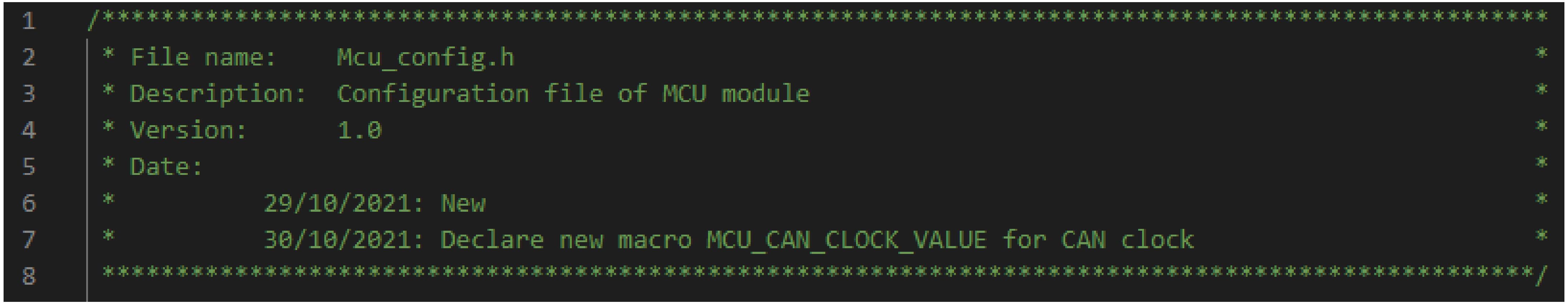
6. File Comment

- At the beginning of a file (.h, .c,)

- Describe: file name, version, what changed…

- 1 line : 80, 100, 120 characters

Ex:



```
/***************************************************************************************************
 * File name:    Mcu_config.h                                                                      *
 * Description:  Configuration file of MCU module                                                  *
 * Version:      1.0                                                                               *
 * Date:                                                                                           *
 *          29/10/2021: New                                                                        *
 *          30/10/2021: Declare new macro MCU_CAN_CLOCK_VALUE for CAN clock                        *
 **************************************************************************************************/
```

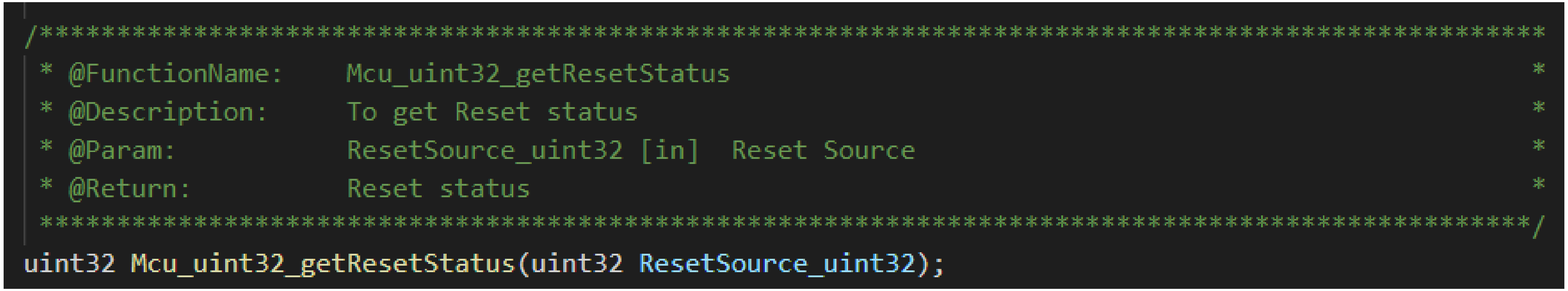
7. Function Comment

- *Before declaration*

- *Describe:*

  Function name, to do what, arguments, return value

- *Ex: [in|out, in, out]*



```
/***************************************************************************************************
 * @FunctionName:    Mcu_uint32_getResetStatus                                                     *
 * @Description:     To get Reset status                                                           *
 * @Param:           ResetSource_uint32 [in]  Reset Source                                         *
 * @Return:          Reset status                                                                  *
 **************************************************************************************************/
uint32 Mcu_uint32_getResetStatus(uint32 ResetSource_uint32);
```

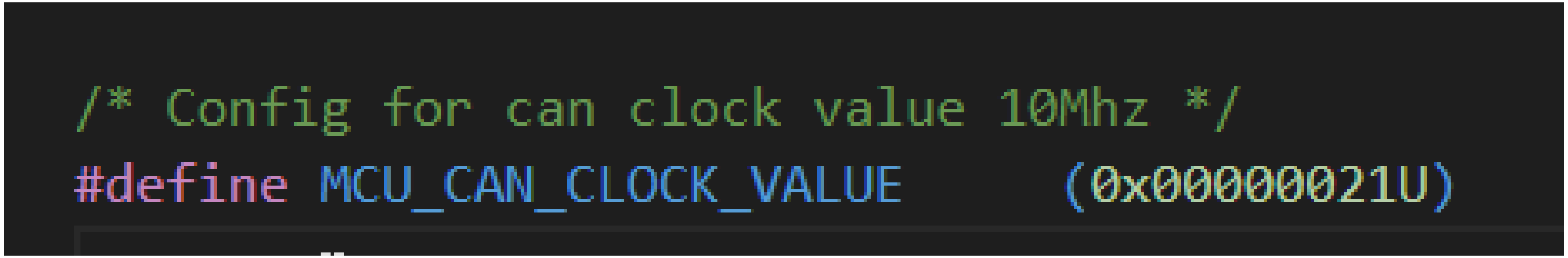
8. Line comment

- *Describe:*

  Describe the meaning of code line

  Block comment: / … */ (not comment as //)*

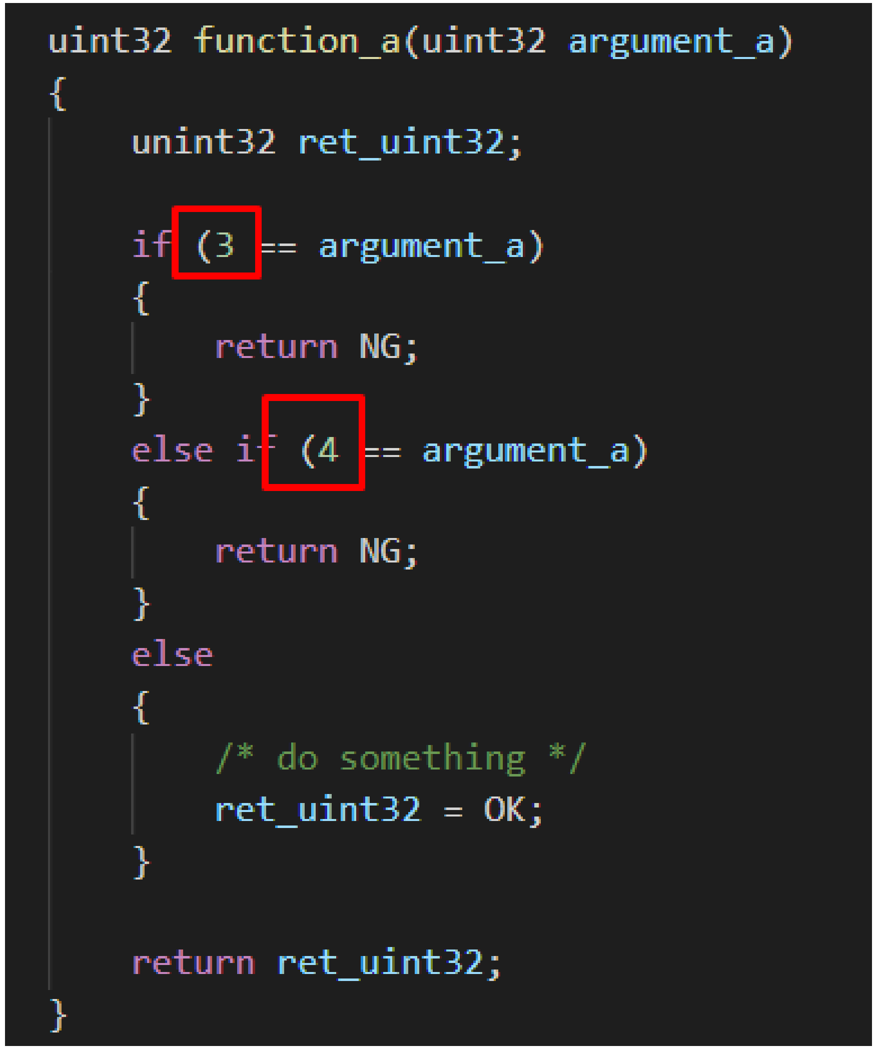
- *Ex: QAC: static check*



```
/* Config for can clock value 10Mhz */
#define MCU_CAN_CLOCK_VALUE       (0x00000021U)
```

9. Hardcode Rule

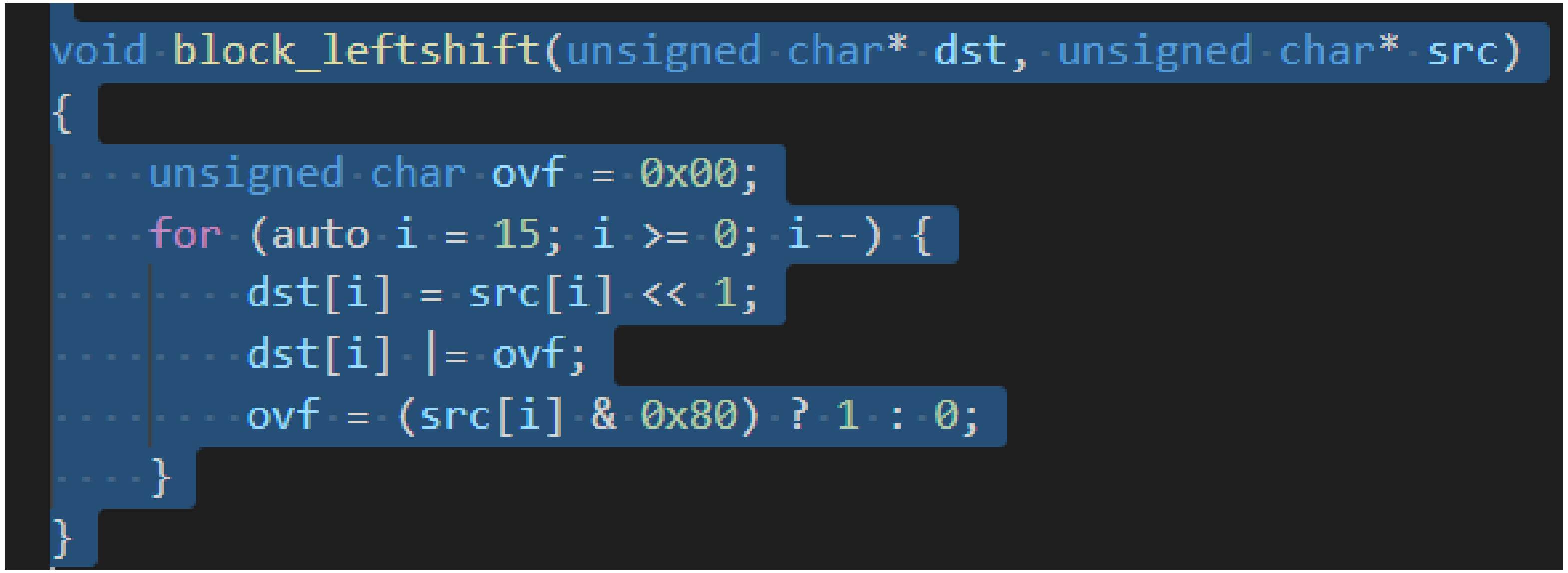
Do not Hardcode !!



```
uint32 function_a(uint32 argument_a)
{
    unint32 ret_uint32;

    if (3 == argument_a)
    {
        return NG;
    }
    else if (4 == argument_a)
    {
        return NG;
    }
    else
    {
        /* do something */
        ret_uint32 = OK;
    }

    return ret_uint32;
}
```

10. Block Indentation

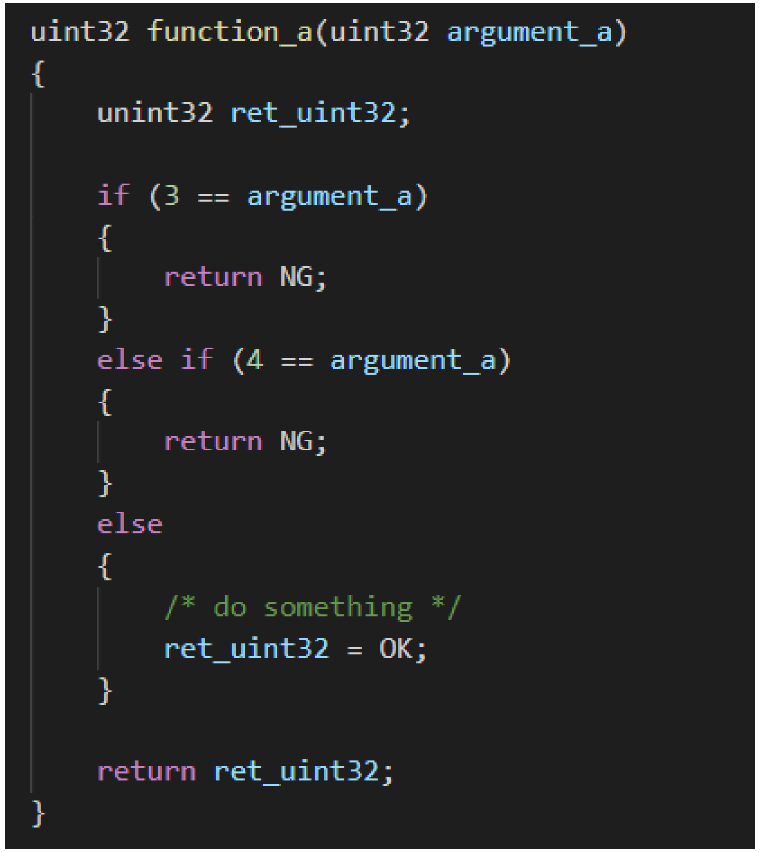
4 whitespaces



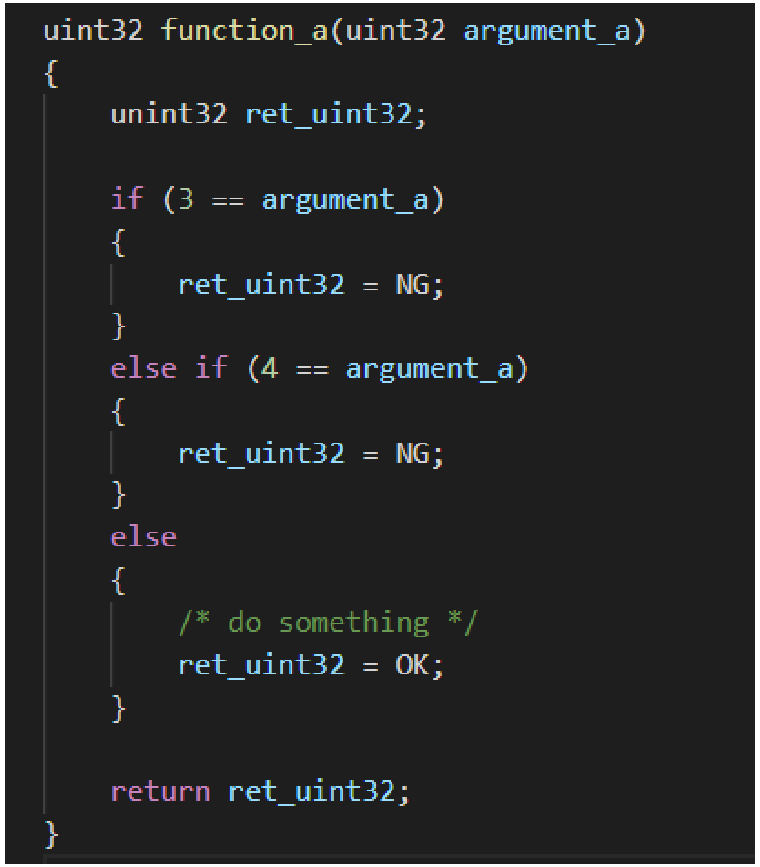
```
void block_leftshift(unsigned char* dst, unsigned char* src)
{
    unsigned char ovf = 0x00;
    for (auto i = 15; i >= 0; i--) {
        dst[i] = src[i] << 1;
        dst[i] |= ovf;
        ovf = (src[i] & 0x80) ? 1 : 0;
    }
}
```

10. Function Return

Only one return keyword in a function implementation



```
uint32 function_a(uint32 argument_a)
{
    unint32 ret_uint32;

    if (3 == argument_a)
    {
        return NG;
    }
    else if (4 == argument_a)
    {
        return NG;
    }
    else
    {
        /* do something */
        ret_uint32 = OK;
    }

    return ret_uint32;
}
```



```
uint32 function_a(uint32 argument_a)
{
    unint32 ret_uint32;

    if (3 == argument_a)
    {
        ret_uint32 = NG;
    }
    else if (4 == argument_a)
    {
        ret_uint32 = NG;
    }
    else
    {
        /* do something */
        ret_uint32 = OK;
    }

    return ret_uint32;
}
```

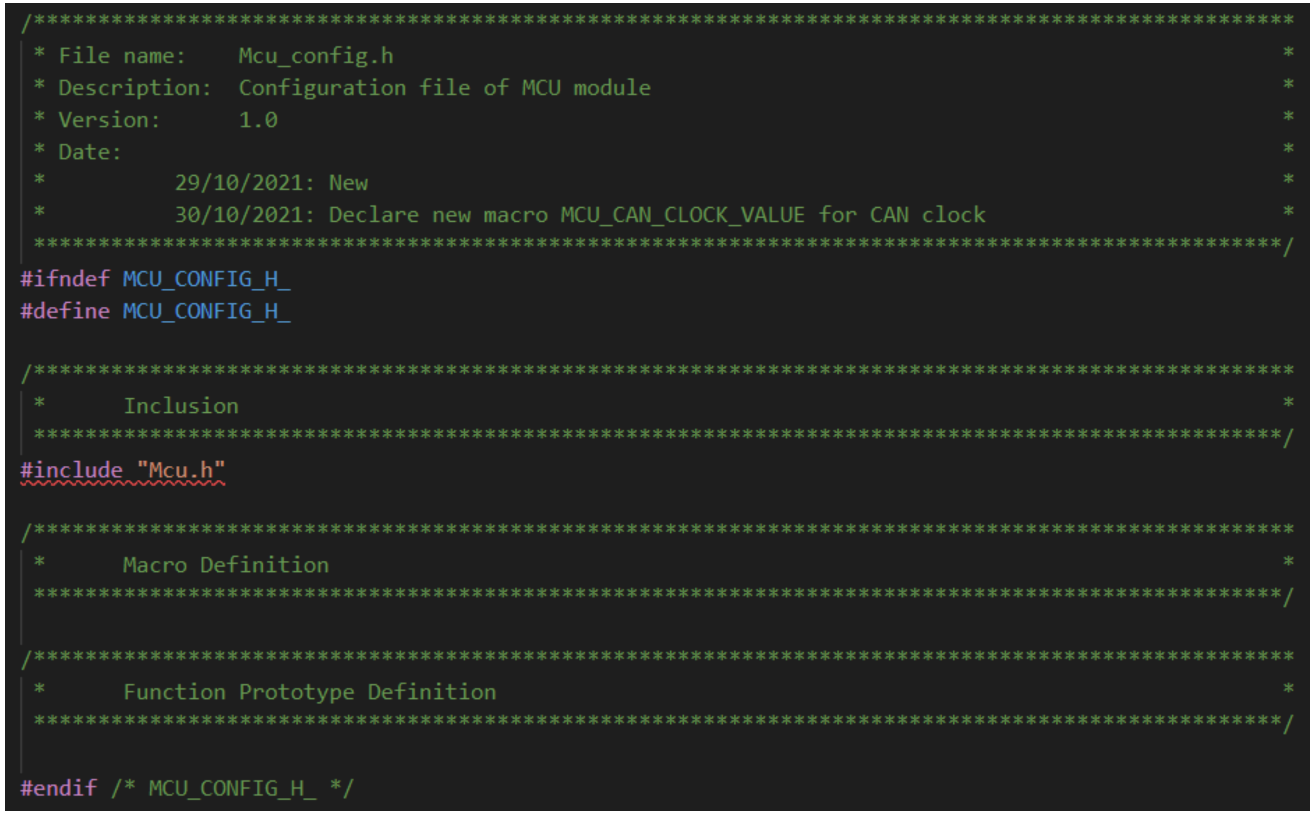
11. Casting Type

Only cast from bigger size to smaller size

Ex: a_uint8 = (uint8)b_uint32;

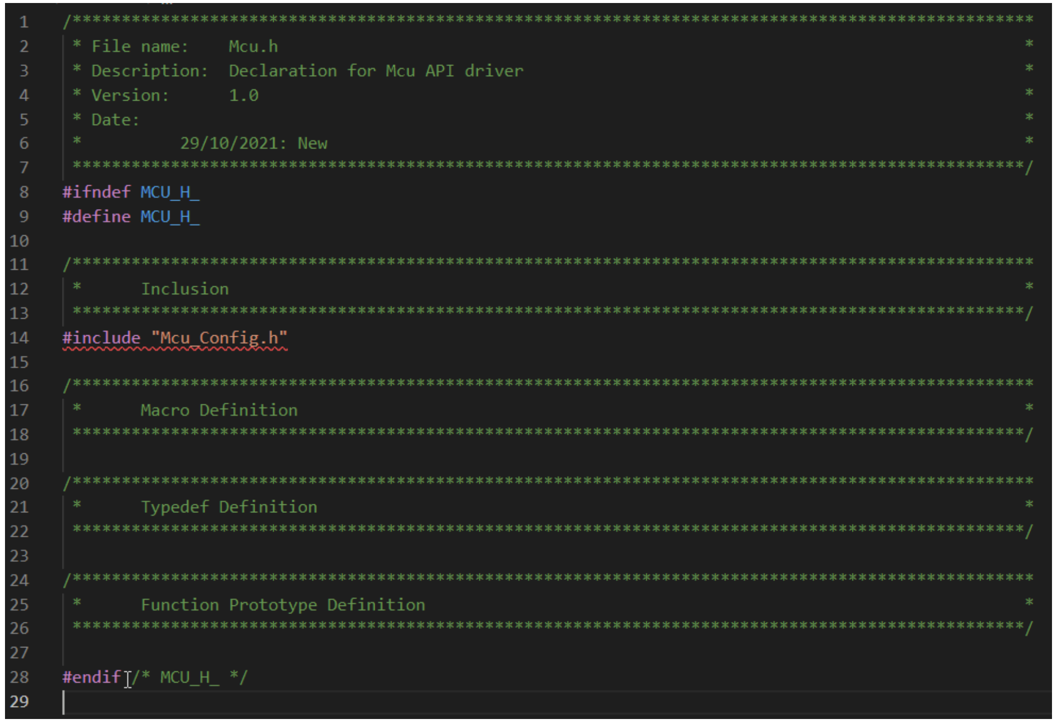
12. Module View in C

Variable declaration
Macro declaration
Function declaration
Register Declaration

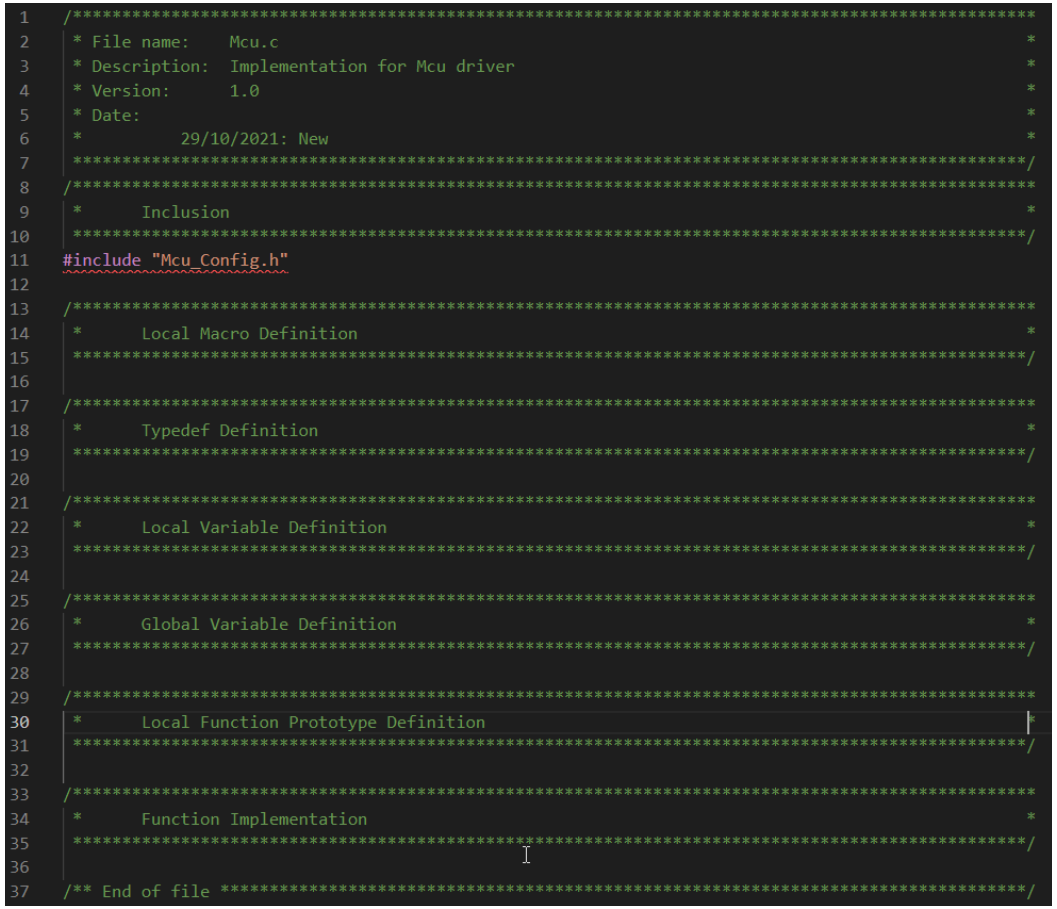


```
/**************************************************************************************************
 * File name:    Mcu_config.h                                                                     *
 * Description:  Configuration file of MCU module                                                 *
 * Version:      1.0                                                                              *
 * Date:                                                                                          *
 *          29/10/2021: New                                                                       *
 *          30/10/2021: Declare new macro MCU_CAN_CLOCK_VALUE for CAN clock                       *
 *************************************************************************************************/
#ifndef MCU_CONFIG_H_
#define MCU_CONFIG_H_

/**************************************************************************************************
 *      Inclusion                                                                                 *
 *************************************************************************************************/
#include "Mcu.h"

/**************************************************************************************************
 *      Macro Definition                                                                          *
 *************************************************************************************************/

/**************************************************************************************************
 *      Function Prototype Definition                                                             *
 *************************************************************************************************/

#endif /* MCU_CONFIG_H_ */
```

12. Module View in C



```c
/**************************************************************************************************
 * File name:    Mcu.h                                                                            *
 * Description:  Declaration for Mcu API driver                                                   *
 * Version:      1.0                                                                              *
 * Date:                                                                                          *
 *          29/10/2021: New                                                                       *
 *************************************************************************************************/
#ifndef MCU_H_
#define MCU_H_

/**************************************************************************************************
 *      Inclusion                                                                                 *
 *************************************************************************************************/
#include "Mcu_Config.h"

/**************************************************************************************************
 *      Macro Definition                                                                          *
 *************************************************************************************************/

/**************************************************************************************************
 *      Typedef Definition                                                                        *
 *************************************************************************************************/

/**************************************************************************************************
 *      Function Prototype Definition                                                             *
 *************************************************************************************************/

#endif /* MCU_H_ */

```



```c
/**************************************************************************************************
 * File name:    Mcu.c                                                                            *
 * Description:  Implementation for Mcu driver                                                    *
 * Version:      1.0                                                                              *
 * Date:                                                                                          *
 *          29/10/2021: New                                                                       *
 *************************************************************************************************/
/**************************************************************************************************
 *      Inclusion                                                                                 *
 *************************************************************************************************/
#include "Mcu_Config.h"

/**************************************************************************************************
 *      Local Macro Definition                                                                    *
 *************************************************************************************************/

/**************************************************************************************************
 *      Typedef Definition                                                                        *
 *************************************************************************************************/

/**************************************************************************************************
 *      Local Variable Definition                                                                 *
 *************************************************************************************************/

/**************************************************************************************************
 *      Global Variable Definition                                                                *
 *************************************************************************************************/

/**************************************************************************************************
 *      Local Function Prototype Definition                                                       *
 *************************************************************************************************/

/**************************************************************************************************
 *      Function Implementation                                                                   *
 *************************************************************************************************/

/** End of file *********************************************************************************/
```

Thank you